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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/665,085	09/17/2003	Sang-Hyun Lee	3364P131	6074

8791   7590   01/17/2007
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EXAMINER
TORRES, JUAN A

ART UNIT	PAPER NUMBER
2611	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/17/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

	Application No.	Applicant(s)
Office Action Summary	10/665,085	LEE ET AL.
	Examiner	Art Unit	
	Juan A. Torres	2611	

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>17 September 2003</u>.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-15</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1, 8 and 15</u> is/are rejected.

7)☒ Claim(s) <u>2-7 and 9-14</u> is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>17 September 2003</u> is/are: a)☐ accepted or b)☒ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☒ All   b)☐ Some * c)☐ None of:

      1.☒ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☒ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date <u>09/17/2003</u>.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application

6)☐ Other: _____.

DETAILED ACTION

Priority

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which

papers have been placed of record in the file.

Information Disclosure Statement

The information disclosure statement filed 09/17/2003 fails to comply with 37

CFR 1.98(a)(2), which requires a legible copy of each cited foreign patent document;

each non-patent literature publication or that portion which caused it to be listed; and all

other information or that portion which caused it to be listed. It has been placed in the

application file, but the information referred to therein has not been considered.

Drawings

The drawings are objected to because:

a) The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4)

because reference character "102" has been used to designate both Ag and A^Tg (see

figure 1).

b) The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5)

because they include the following reference character(s) not mentioned in the

description: "100", "106", "107", "109" (figure 1); "204" (FIGURE 2); "400, "401", "402"

(FIGURE 4); "500" (FIGURE 5); and "600", "602" and "603" (figure 6).

c) Figure 2 should be designated by a legend such as --Prior Art-- because only

that which is old is illustrated. See MPEP § 608.02(g) (see figure 2 of Sun "A hybrid

interference canceller in CDMA", 1998 IEEE 5th International Symposium on Spread

Spectrum Techniques and Applications, 1998, Proceedings, Volume 1, 2-4 Sept. 1998

Page(s): 150 – 154, vol.1).

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

The disclosure is objected to because of the following informalities: in page 20 line 10 the recitation "x1, x2, . . . , x_n" is improper; it is suggested to be changed to "x_1, x_2, . . . , x_n".

Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 8 and 15 are rejected under 35 U.S.C. 102(b) as being anticipated by

Ang ("A method of limiting the processing delay of the improved multi-stage variable

group hybrid interference cancellation scheme for CDMA systems", VTC 1999 – Fall,

IEEE VTS 50th Vehicular Technology Conference, 1999. Volume 3, 19-22 Sept. 1999

Page(s):1648 - 1652 vol.3).

As per claim 1, Ang discloses a hybrid multi-user interference cancellation

method for canceling interference between a plurality of user signals, comprising

receiving a plurality of external user signals, calculating powers of the user signals, and

providing user numbers to the calculated signal powers in their intensity orders (figure 1

section II pages 1648-1649); sorting the user numbers in descending order (figure 1

section II pages 1648-1649); forming at least one user cluster so that the signal powers

following the sorted user numbers may differ less from a central value or a mean value

in the same cluster (figure 1 section II pages 1648-1649); and performing parallel

interference cancellation on the respective user signals within the same cluster, and

performing successive interference cancellation between the formed clusters (abstract

and figure 1 section II pages 1648-1649).

As per claim 8, Ang discloses a hybrid multi-user interference canceller for canceling interference between a plurality of user signals, comprising a channel estimator for receiving a plurality of external user signals, calculating powers of the user signals, and numbering the calculated signal powers in their intensity orders (figure 1 Matched filters, section II pages 1648-1649); a sorter for sorting the user numbers in descending order (figure 1 section II pages 1648-1649); a cluster calculator/former for forming at least one user cluster so that the signal powers following the sorted user numbers may differ less from a central value or a mean value in the same cluster (figure 1 section II pages 1648-1649); and a hybrid interference canceller for performing parallel interference cancellation on the respective user signals within the same cluster, and performing successive interference cancellation between the formed clusters (abstract and figure 1 section II pages 1648-1649).

As per claim 15, Ang discloses receiving a plurality of external user signals, calculating powers of the user signals, and numbering the calculated signal powers in their intensity orders (figure 1 section II pages 1648-1649); sorting the user numbers in descending order (figure 1 section II pages 1648-1649); forming at least one user cluster so that the signal powers following the sorted user numbers may differ less from a central value or a mean value in the same cluster (figure 1 section II pages 1648-1649); and performing parallel interference cancellation on the respective user signals within the same cluster, and performing successive interference cancellation between the formed clusters (abstract and figure 1 section II pages 1648-1649).

Claims 1, 8 and 15 are rejected under 35 U.S.C. 102(b) as being anticipated by Sun ("A hybrid interference canceller in CDMA", 1998 IEEE 5th International Symposium on Spread Spectrum Techniques and Applications, 1998, Proceedings, Volume 1, 2-4 Sept. 1998 Page(s): 150 - 154 vol.1).

As per claim 1, Sun discloses a hybrid multi-user interference cancellation method for canceling interference between a plurality of user signals, comprising receiving a plurality of external user signals, calculating powers of the user signals, and providing user numbers to the calculated signal powers in their intensity orders (abstract, figures 1-3 section III pages 151-152); sorting the user numbers in descending order (abstract, figures 1-3 section III pages 151-152); forming at least one user cluster so that the signal powers following the sorted user numbers may differ less from a central value or a mean value in the same cluster (abstract, figures 1-3 section III pages 151-152); and performing parallel interference cancellation on the respective user signals within the same cluster, and performing successive interference cancellation between the formed clusters (abstract, figures 1-3 section III pages 151-152).

As per claim 8, Sun discloses a hybrid multi-user interference canceller for canceling interference between a plurality of user signals, comprising a channel estimator for receiving a plurality of external user signals, calculating powers of the user signals, and numbering the calculated signal powers in their intensity orders (abstract, figures 1-3 section III pages 151-152 last paragraph); a sorter for sorting the user numbers in descending order (abstract, figures 1-3 section III pages 151-152); a cluster

calculator/former for forming at least one user cluster so that the signal powers following the sorted user numbers may differ less from a central value or a mean value in the same cluster (abstract, figures 1-3 section III pages 151-152); and a hybrid interference canceller for performing parallel interference cancellation on the respective user signals within the same cluster, and performing successive interference cancellation between the formed clusters (abstract, figures 1-3 section III pages 151-152).

As per claim 15, Sun discloses receiving a plurality of external user signals, calculating powers of the user signals, and numbering the calculated signal powers in their intensity orders (abstract, figures 1-3 section III pages 151-152); sorting the user numbers in descending order (abstract, figures 1-3 section III pages 151-152); forming at least one user cluster so that the signal powers following the sorted user numbers may differ less from a central value or a mean value in the same cluster (abstract, figures 1-3 section III pages 151-152); and performing parallel interference cancellation on the respective user signals within the same cluster, and performing successive interference cancellation between the formed clusters (abstract, figures 1-3 section III pages 151-152).

Allowable Subject Matter

Claims 2-7 and 9-14 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Liberti (US 20030206577 A1) discloses a combined adaptive spatio-temporal processing and multi-user detection for CDMA wireless systems, using a channel estimator to device the users in groups of similar power levels and order the groups in descending order and performing parallel interference cancellation and successive interference cancellation. Ang ("A Novel Variable Group Hybrid Interference Cancellation Scheme for CDMA Systems", ITC'99, Cheju, June 1999) also discloses the hybrid cancellation technique. Ang ("An Improved Multi-Stage Variable Group Hybrid Multi-User Interference Cancellation Scheme for CMDA Systems", PIRMC'99, Osaka, Japan, September 1999) also discloses the hybrid cancellation technique.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Juan A. Torres whose telephone number is (571) 272-3119. The examiner can normally be reached on Monday-Friday 9:00 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad H. Ghayour can be reached on (571) 272-3021. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the

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Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

USPTO Customer Service Representative or access to the automated information

system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Juan Alberto Torres
11-14-2006